

# OUTPUT PENTODE

# EL38

Output pentode primarily intended for use as line time base output valve in A.C. television receivers.

## HEATER

$V_h$	6.3	V
$I_h$	1.4	A

## CAPACITANCES

$C_{in}$	18	$\mu\mu F$
$C_{out}$	8.0	$\mu\mu F$ ←
$C_{a-gl}$	< 1.2	$\mu\mu F$

## CHARACTERISTICS

$V_a$	275	V
$V_{g2}$	275	V
$I_a$	91	mA
$I_{g2}$	11	mA
$V_{g1}$	-9	V
$g_m$	14	mA/V
$(\mu_{gl-g2})$	16.5	
$r_a$	20	k $\Omega$

## OPERATION AS LINE OUTPUT PENTODE

### Circuit Design

To allow for valve spread and for deterioration during life the line output stage should be designed around the following values :—

$V_a$	90	V
$V_{g2}$	275	V
$I_a$	150	mA

For the average new valve the following figures will apply:—

$V_a$	90	V
$V_{g2}$	275	V
$V_{g1}$	-1	V
$I_a$	225	mA

### Typical Circuit (See circuit on page 3)

$V_b$	300	V
<b>For EL38</b>		
$I_a$	64	mA
$I_{g2}$	18	mA
$R_k$	120	$\Omega$
<b>For EBC33</b>		
$I_a$	0.8	mA

N.B.—Above figures measured under synchronised conditions.

## LIMITING VALUES

$V_{a(b)} \text{ max.}$	1.2	kV
$V_a \text{ max.}$	800	V
$V_{a(pk)} \text{ max.}$	8	kV
$V_{g2(b)} \text{ max.}$	800	V
$V_{g2} \text{ max.}$	400	V
$p_a \text{ max.}$	25	W
$p_{g2} \text{ max.}$	8	W
$I_k \text{ max.}$	200	mA
$V_{g1} \text{ max. (} I_{g1} = +0.3 \mu A \text{)}$	-1.3	V
$R_{gl-k} \text{ max. (} p_a < 25W \text{)}$	500	k $\Omega$
$R_{gl-k} \text{ max. (} p_a < 9W \text{)}$	800	k $\Omega$
$V_{h-k} \text{ max.}$	100	V
$R_{h-k} \text{ max.}$	20	k $\Omega$

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### CIRCUIT VALUES (see circuit on page 3)

Resistors		Value	Wattage	Tolerance
R <sub>1</sub>	47	k $\Omega$	$\frac{1}{4}$ W	20%
R <sub>2</sub>	330	k $\Omega$	$\frac{1}{4}$ W	10%
R <sub>3</sub>	50	k $\Omega$	1 W	Potentiometer
R <sub>4</sub>	680	$\Omega$	$\frac{1}{4}$ W	10%
R <sub>5</sub>	820	k $\Omega$	$\frac{1}{4}$ W	20%
R <sub>6</sub>	120	$\Omega$	1 W	20%
R <sub>7</sub>	500	$\Omega$	4 W	Potentiometer
R <sub>8</sub>	2.2	k $\Omega$	$\frac{1}{4}$ W	20%
R <sub>9</sub>	2.5	k $\Omega$	4 W	Potentiometer
R <sub>10</sub>	2.7	k $\Omega$	4 W	20%
R <sub>11</sub>	100	$\Omega$	$\frac{1}{4}$ W	20%

Capacitors		Value	Tolerance	Wkg. Voltage
C <sub>1</sub>	0.1	$\mu$ F	20%	350 V
C <sub>2</sub>	0.0022	$\mu$ F	20%	350 V
C <sub>3</sub>	0.01	$\mu$ F	10%	350 V
C <sub>4</sub>	0.001	$\mu$ F	10%	350 V
C <sub>5</sub>	0.004–0.006	$\mu$ F	—	500 V

### Transformers

- T1 Ratio 1 : 3 (step-up into grid circuit)  
 T2 Ratio 4 : 1 primary inductance  $\leq 1$  H

### Deflector Coils

Resistance	3 $\Omega$
Inductance	6.5 mH

To provide full scan for 9" picture tube ( $V_{a2}=7$ kV) with peak to peak current swing of 500 mA.

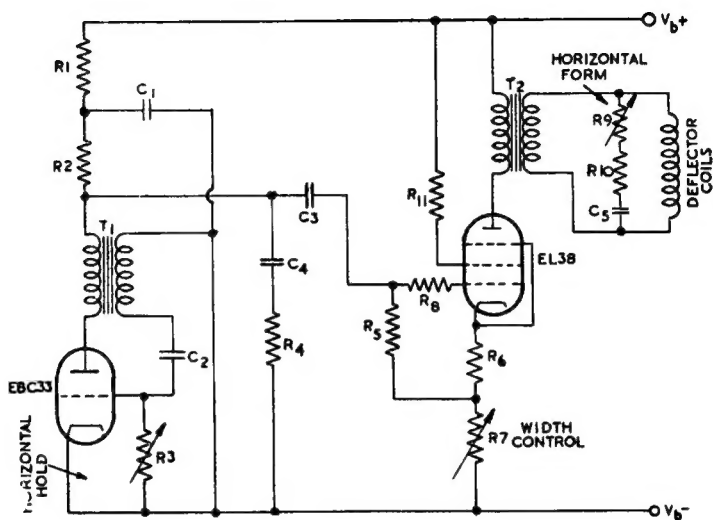
### Notes

- Synchronising pulses may be applied negatively to the anode or positively to the grid of the EBC33.
- The decoupling components (R<sub>1</sub> C<sub>1</sub>) in the anode circuit of the EBC33 are necessary only if there is ripple on the H.T. line.
- All potentiometers should be linear components to provide smooth control.

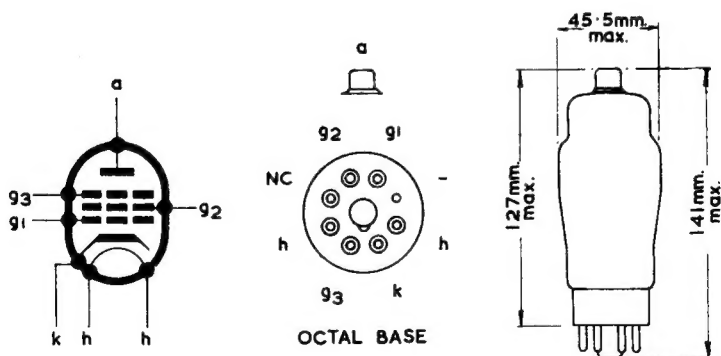
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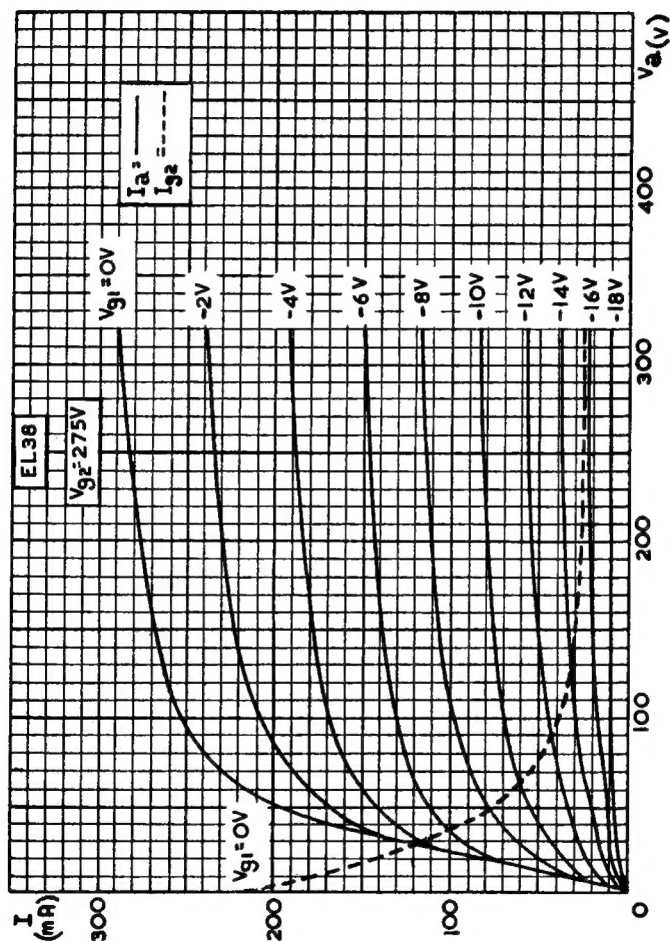


LINE TIME BASE CIRCUIT



732

Output pentode primarily intended for use as line time base output valve in A.C. television receivers.



ANODE CURRENT AND SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER